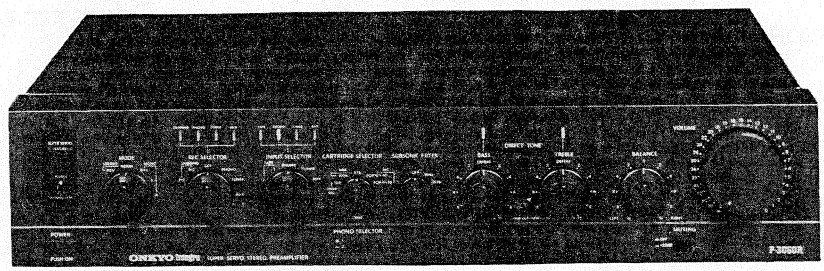
SERIAL NO. 3141

ONKYO® SERVICE MANUAL

SUPER SERVO STEREO

PREAMPLIFIER

MODEL P-3060R



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ONKYO®
AUDIO COMPONENTS

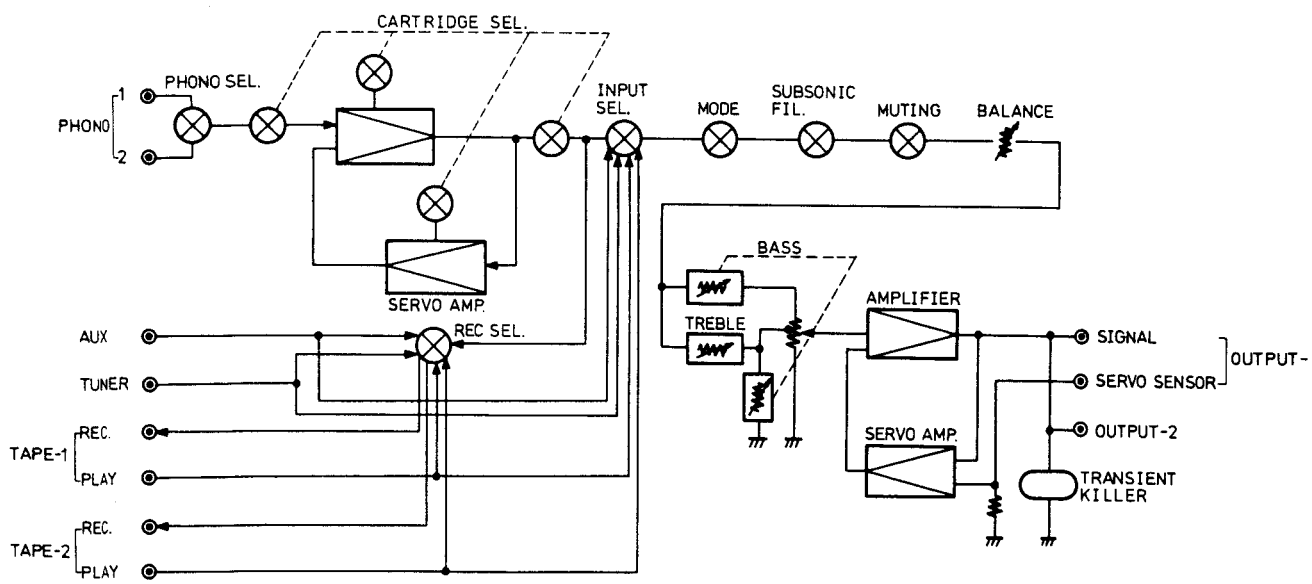
SPECIFICATIONS

Input Sensitivity and Impedance :	PHONO MC :	HIGH MC 2.5 mV/100 ohms 130 μV/(100/330) ohms
	PHONO MM :	2.5 mV/(47 kΩ/100 kΩ)
	TUNER :	150 mV/47 kΩ
	TAPE PLAY :	150 mV/47 kΩ
	AUX :	150 mV/47 kΩ
Rated Output and Impedance :	TAPE REC :	150 mV/2.2 kΩ (PHONO)
	OUTPUT :	1.0 V/220 Ω Max. 20V
RIAA Deviation :	±0.2 dB, 20 — 20,000 Hz	
Frequency Response (TUNER) :	+ 0, −3dB, 0.8 Hz — 170 kHz	
Phono Overload :	PHONO MM :	300 mV RMS at 1 kHz, THD. 0.05% 1400 mV RMS at 10 kHz, THD. 0.05%
	PHONO MC :	17 mV RMS at 1 kHz, THD. 0.05% 82 mV RMS at 10 kHz, THD. 0.05%
Total Harmonic Distortion :	0.003% at PHONO MM, 3 V output 0.005% at PHONO MC, 3 V output 0.002% at TUNER, AUX, TAPE, 3V output	
Intermodulation Distortion :	0.003% (70 Hz : 7 kHz = 4:1)	

Signal to Noise Ratio :	PHONO MC :	76 dB (IHF A-202)
	PHONO MM :	82 dB (IHF A-202)
	TUNER :	93 dB (IHF A-202)
Tone Control : (Vol −20 dB)	BASS :	±8 dB at 70 Hz
	TREBLE :	±8 dB at 20 kHz
Filters :	HIGH CUT :	(Vol. min.) 6 dB/oct, 7 kHz
	SUBSONIC :	6 dB/oct 15 Hz/20Hz
Audio Muting :	−20 dB	
Rated Output Voltage :	1.0 V	
Inputs :	PHONO 1 & 2 TUNER TAPE PLAY 1 & 2 AUX	
Outputs :	TAPE REC OUT 1 & 2 OUTPUT :	−1 (for servo sensor cable used) −2 (for normal cable)
Semiconductors :	49 Transistors, 37 Diodes, 8 FETs, 4 ICs	
Dimensions :	450(W) x 99(H) x 403(D) mm (17-3/4" x 3-15/16" x 15-3/4")	
Weight :	9.5 kg. (21 lbs.)	
Power Supply Rating :	AC 120 V, 60 Hz, D model AC 220V, 50 Hz, G model	

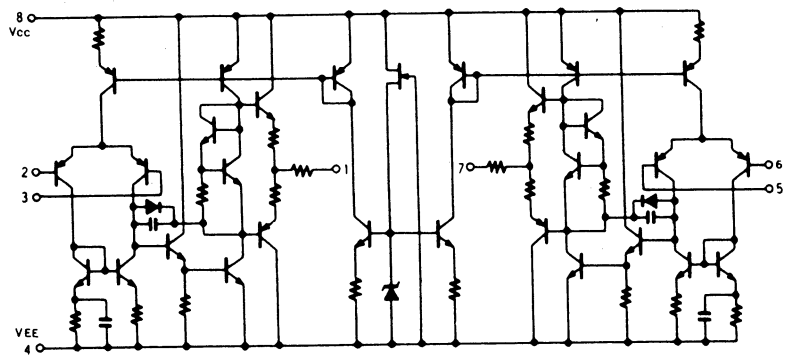
Specifications and features are subject to change without notice.

BLOCK DIAGRAM



IC BLOCK DIAGRAM

NJM-4558

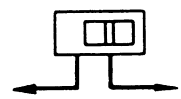


PRECAUTIONS

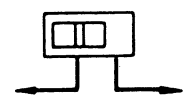
1. **Replacing the fuses**
   For continued protection against fire hazard, replace only with same type and same rating fuse.

CIRCUIT NO.	PARTS NO.	DESCRIPTION	REMARKS
F1	252045	1A(ST-6), AC fuse	120V model
F901, F902	252095	0.5A(ST-6), AC fuse	120V model
F1	252087	0.2A-SE-EAWK, AC fuse	220V model
F901-F904	252063	0.5A-SE-EAWK, AC fuse	220V model

2. **Voltage Selector (rear panel)**
   Some models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver or similar instrument to the right or left position. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



at AC 120 V



at AC 220 V

ADJUSTMENTS

(1) Preparations

Place the unit on a level surface and leave the power on for five minutes or more, making sure the ventilation openings are not blocked. Then perform the following adjustments.

(2) Center voltage of equalizer amp

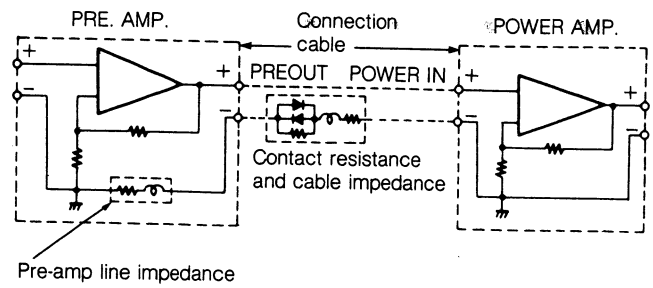
a. Connect a high sensitivity DC voltmeter to the TAPE-REC terminals. (The REC-SELECTOR should be in the PHONO position.)
b. Ground test point TP1-L(TP1-R) of circuit board NAEQ-721B and adjust the semi-fixed resistor R217(R218) so that the voltmeter reading is 0 ±50 mV.
c. Remove the ground on test point TP1-L(TP1-R) and, after about 30 seconds, adjust the semi-fixed resistor R301(R302) so that the voltmeter reading is 0 ±150μV.

(3) Center voltage of flat amp

a. Connect a high sensitivity DC voltmeter to OUTPUT terminal 1 or 2 and turn the VOLUME control to the minimum setting.
b. Ground test point TP2-L(TP2-R) of circuit board NAOP-726B and confirm that the voltmeter reading is 0 ±400mV.
c. Remove the ground on test point TP2-L(TP2-R) and, after about 30 seconds, adjust the semi-fixed resistor R543(R544) so that the voltmeter reading is 0 ±50μV.

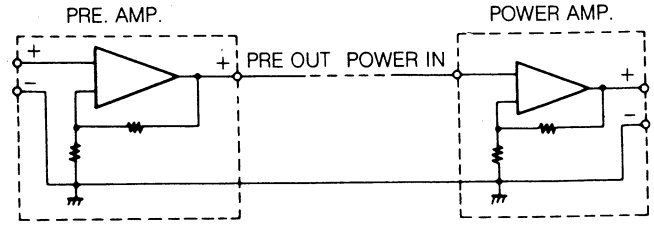
THE PRE-AMP/POWER AMP CONNECTION

Since the pre-amp does not handle large currents, internal signal degradation resulting from differences in impedances can be held to a very low level. However, when the pre and power amps are separate components, they are usually connected by connection cables. This can generate crosstalk due to the cableimpedance and the diode effect at the pin contact points, resulting in a loss in sonic definition and presence. With the Super Servo integral system, both the plus and minus terminals in the signal path are controlled by the Servo circuit. Furthermore, there is a second servo loop on the grounded side to detect and cancel differences in ground potential between the pre- and power amps. The ground line also carries a DC bias idle current to suppress non-linearities generated at the contact points and thereby prevent the generation of inter-modulation distortion.

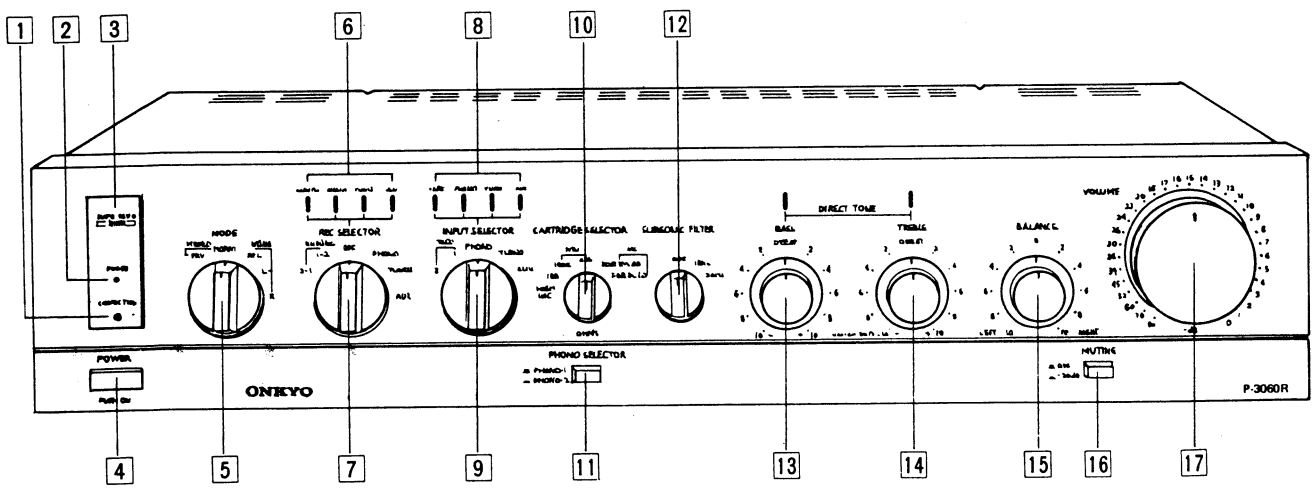


THE SUPER SERVO CABLE

When the accessory Super Servo cables are used, the CONNECTION lamp above the power switch will light. The fact that Super Servo cables are connected is detected by Q806. Q807 then turns on the front panel CONNECTION lamp. When using the Super Servo cables, always confirm that this lamp is lit before using the amplifier. Ordinary connection cables can be used to connect the pre-amp and power amp, but then only the normal Super Servo effect will be obtained and the CONNECTION lamp will not light.

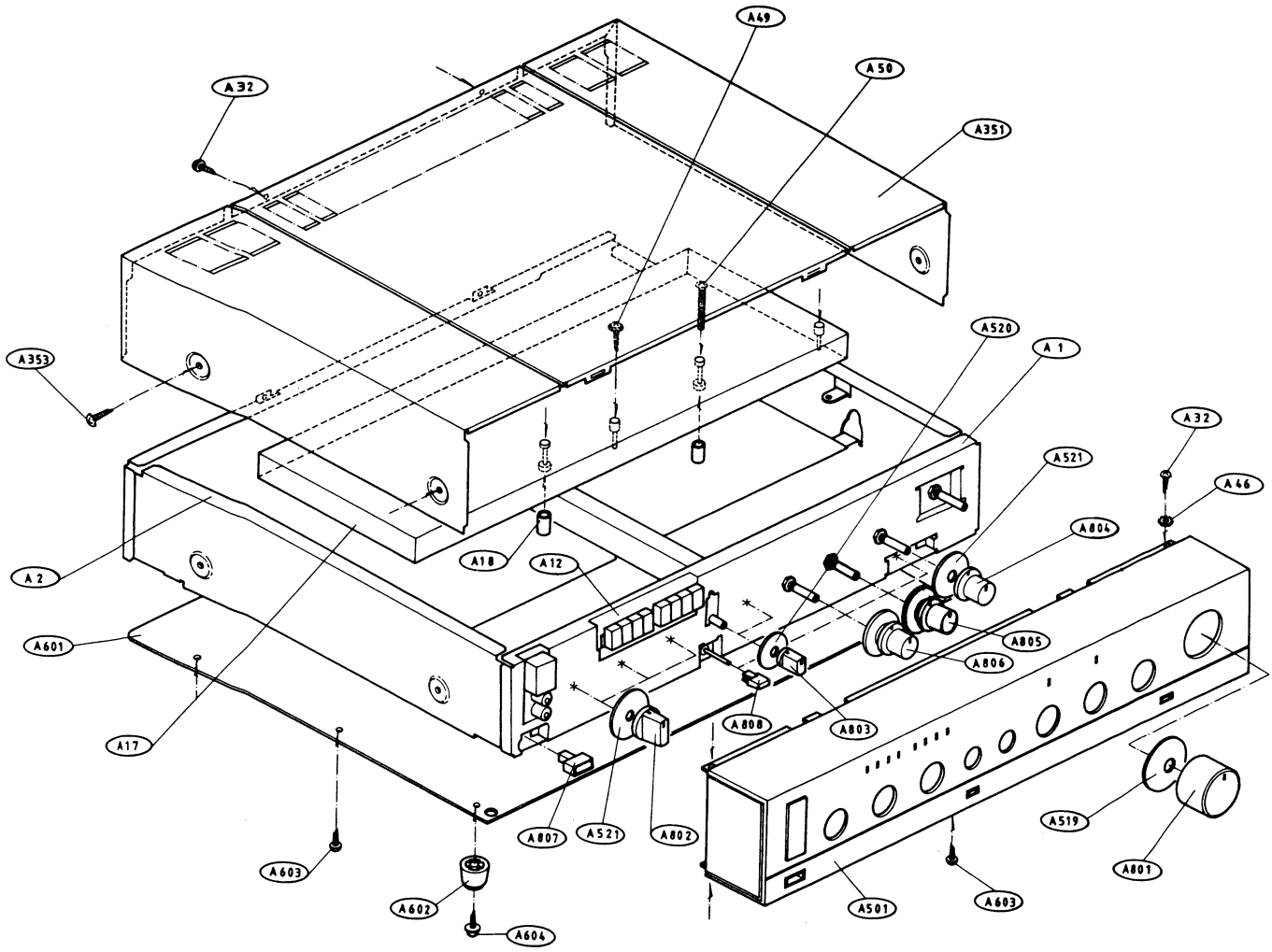


FRONT PANEL



1. Connection lamp
2. Power lamp
3. Super servo integral lamp
4. Power switch
5. Mode selector
6. Recording source indicator lamps
7. Recording source selector
8. Input selector indicator lamps
9. Input selector
10. Cartridge selector
11. Phono selector
12. Subsonic filter switch
13. Bass control
14. Treble control
15. Balance control
16. Muting switch
17. Volume control

EXPLODED VIEW

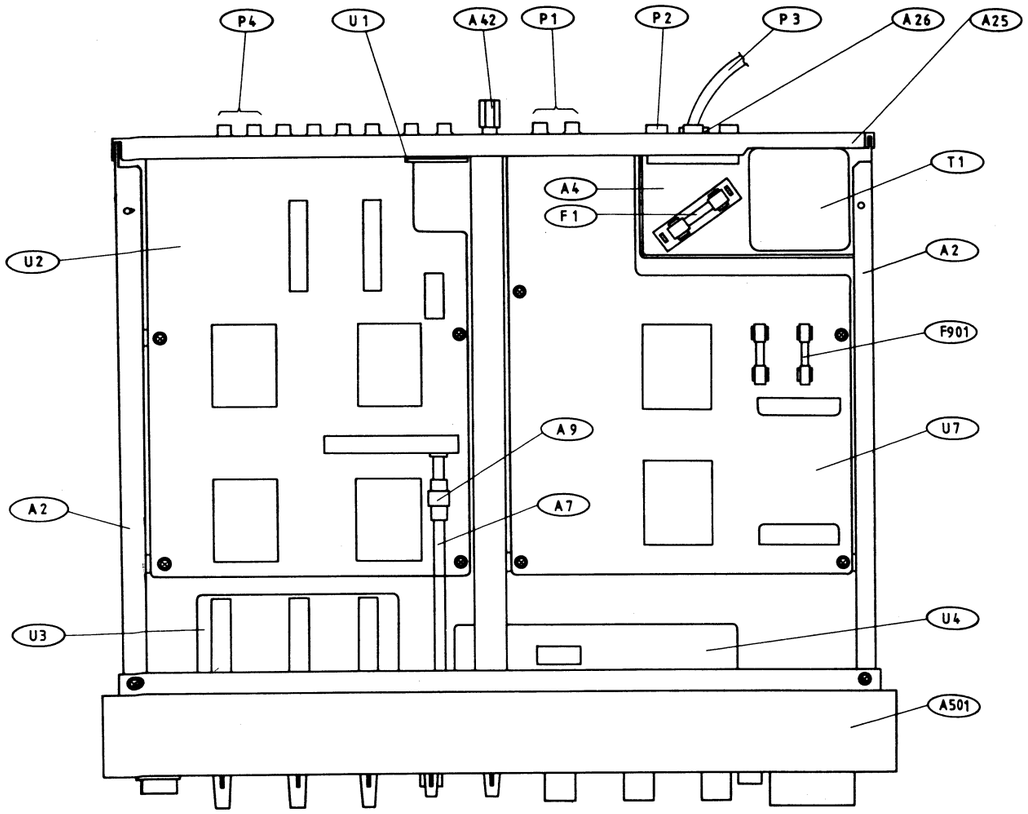


PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A1	27110151	Front bracket
A2	27115050C	Side bracket
A4	27130163A	Bracket, Power transformer (D)
	27130323	Bracket, Power transformer (G)
A7	27260066	Shaft, Speaker
A9	27273008	Joint, Speaker shaft
A17	27150135B	Shielded plate
A18	27300228	Bearing
A25	27120451	Back panel (D)
	27120452	Back panel (G)
A26	270280	SR-4K-4, Strainrelief
A32	834430068	3TTS + 6B(BC), Tapping screw
A42	TP160B	Ground terminal
A46	87243006	3mm, Toothed washer
A49	834430168	3TTS + 16B(BC), Tapping screw
A50	82543035	3B + 35FN(BC), Tapping screw
A351	28184124-1	Top cover
A353	838440089	4TTB + 8C(BC), Tapping screw
A501	12368121	Front panel ass'y

REF. NO.	PARTS NO.	DESCRIPTION
A519	28140126	53mm, Cushion
A520	28140127	32mm, Cushion
A521	28140185	40mm, Cushion
A601	27170065A	Bottom board
A602	27175009A	T-C, Leg
A603	831430088	3TTW + 8B(BC), Tapping screw
A604	831130128	3TTW + 12B, Tapping screw
A801	28320649	Knob, Volume
A802	28320647A	Knob, Selector
A803	28320648B	Knob, Cartridge
A804	28320652	Knob, Balance
A805	28320653A	Knob ass'y, Treble control
A806	28320654A	Knob ass'y, Bass control
A807	28320646	Knob, Power switch
A808	28320645	Knob
C1	3500065A	0.01μF, 400V, Capacitor IS
C2-C9	379124737	0.047μF, 50V, Capacitor DEW
C231, C233	3800003	0.1μF, 100V, Capacitor DTG
Cla	27300080	Cover, capacitor

COMPONENT LOCATION



REF. NO.	PARTS NO.	DESCRIPTION
T001	230662	NPT-754D, Power transformer (D)
	230663	NPT-754G, Power transformer (G)
S1	25035345	NPS-111-L308P, Power switch (D)
	25035176	NPS-111-L140, Power switch (G)
S102, S103	25065175	Switch wire of remote
P1	25045052	NPJ4PRBL26, Terminal
P2	25050046	NSCT-2P15, AC outlet (D)
P3	253100	AS-UC-4, Power supply cable (D)
	253083	AS-CEE, Power supply cable (G)
P4	25045043	NPJ4PDBL20, Input terminal
F1	252045	1A(ST-6), AC fuse(D)
	252087	0.2A-SE-EAWK, AC fuse (G)
Fla	252050050	H0438A, Fuseholder (D)
F901, F902	252095	0.5A(ST-6), AC fuse (D)
F901-F904	252063	0.5A-SE-EAWK, AC fuse (G)
Fla, F901a-F904a	25065096	NPF-073, Fuseholder (G)
U1	12792548	NAPJ-748, Phono input terminal pc board ass'y
U2	12368521C	NAEQ-721C, Equalizer amplifier pc board ass'y
U3	12790522B	NASW-722B, Switch circuit pc board ass'y
U4	12790523B	NATC-723B, Tone control pc board ass'y
U5	12790524A	NAAB-724A, Muting switch pc board ass'y
U6	12792525	NAVR-725, Volume control pc board ass'y
U7	12368526C	NAOP-726C, Output amplifier pc board ass'y (D)
	12374526D	NAOP-726d, Output amplifier pc board ass'y (G)

Note
(D) : Only 120V model
(G) : Only 220V model

PRINTED CIRCUIT BOARD PARTS LIST

PHONO INPUT TERMINAL PC BOARD (NAPJ-748)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	25045066	NPJ-4PDBL33, Terminal

EQUALIZER AMPLIFIER PC BOARD (NAEQ-721C)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q301, Q302	222502	NJM4558DX
	Transistors	
Q201-Q204	2211530	2SK146
Q205, Q206,	2211445 or	2SC2291(F) or
Q213, Q214	2211446	2SC2291(G)
Q207, Q208,	2211653 or	2SC2235(O) or
Q215, Q216	2211654	2SC2235(Y)
Q209, Q210	2210700	2SC1583(O-001)
Q211, Q212	2211585 or	2SA979(F) or
	2211586	2SA979(G)
Q217, Q218	2211643 or	2SA965(O) or
	2211644	2SA965(Y)
Q303-Q306	2211254 or	2SC1815(Y) or
	2211255	2SC1815(GR)
Q307, Q308	2211515 or	2SA995(F) or
	2211516	2SA995(G)
Q907	2211163 or	2SC2120(O) or
	2211164	2SC2120(Y)
Q908	2211503 or	2SA950(O) or
	2211504	2SA950(Y)
	Diodes	
D201-D304	223133 or	DS442X or
	223105	1S1555
D904, D905	224124	GZA22U
	Capacitors	
C201, C202	372322214	220pF, 50V, stylor
C203, C204	379128224	8200pF, 50V, DEW
C205, C206	379121234	0.01μF, 50V, DEW
C207, C208	379121134	0.11μF, 50V, DEW
C209-C212	379123334	0.033μF, 50V, DEW
C219, C220	379121035	0.01μF, 50V, DEW
C223, C224	379221057	1μF, 50V, DEW
C225, C226	379121524	1500pF, 50V, DEW
C227, C228	379123324	3300pF, 50V, DEW
C301-C304	390884707	47μF, 50V, SLD
C311, C312	379121047	0.1μF, 50V, DEW
C931, C932	352780109	1μF, 50V, Elect.
	Resistors	
R217, R218	5225066	N10HR330BDM, Semi fixed
R229, R230	441525614	560Ω, 1/2W, Metal oxide film
R265-R268	441523304	33Ω, 1/2W, Metal oxide film
R301, R302	5225070	N10HR2.2KBDM, Semi fixed
	Switches	
S101	25035159A	NPS-122-L123
S102a, S103a	25065079	NSS-4643
S201	25030138	NPS-185-20ZR
	Terminal	
P4	25045043	NPJ-4PDBL20
	Case	
	27300425	

SWITCH CIRCUIT PC BOARD (NASW-722B)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistor	
Q806, Q807	2211503 or	2SA950(O) or
	2211504	2SA950(Y)
	Resistors	
R807	441521114	110Ω, 1/2W, Metal oxide film
R808	441522204	22Ω, 1/2W, Metal oxide film
R809, R810	441529104	91Ω, 1/2W, Metal oxide film
R817	441523014	300Ω, 1/2W, Metal oxide film
R824, R826	441526804	68Ω, 1/2W, Metal oxide film
	Switches	
S102b	25030210	NRSM-146-15ZV
S103b	25030209	NRSM-145-15ZV
S401	25030208	NRSM-165-15ZK

TONE CONTROL PC BOARD (NATC-723B)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C401, C402	379121545	0.15μF, 50V, DEW
C403, C404	379126835	0.068μF, 50V, DEW
C405, C406	379121235	0.012μF, 50V, DEW
C407, C408	379126224	6200pF, 50V, DEW
C409, C410	372329114	91pF, 50V, Stylor
C411, C412	379123335	0.033μF, 50V, DEW
	Resistors	
R409	5104126	N27DGLC250KMN25M, Balance control variable
R411	5104125	N27DTLS11219K25M, Treble control variable
R413	5104124	N27DFLS11110K180K25M, Bass control variable
	Switch	
S402	25030207	NRSM-143-15ZV

MUTING SWITCH PC BOARD (NAAB-724A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Switch	
S403	25035160A	NPS-122-L124

VOLUME CONTROL PC BOARD (NAVR-725)

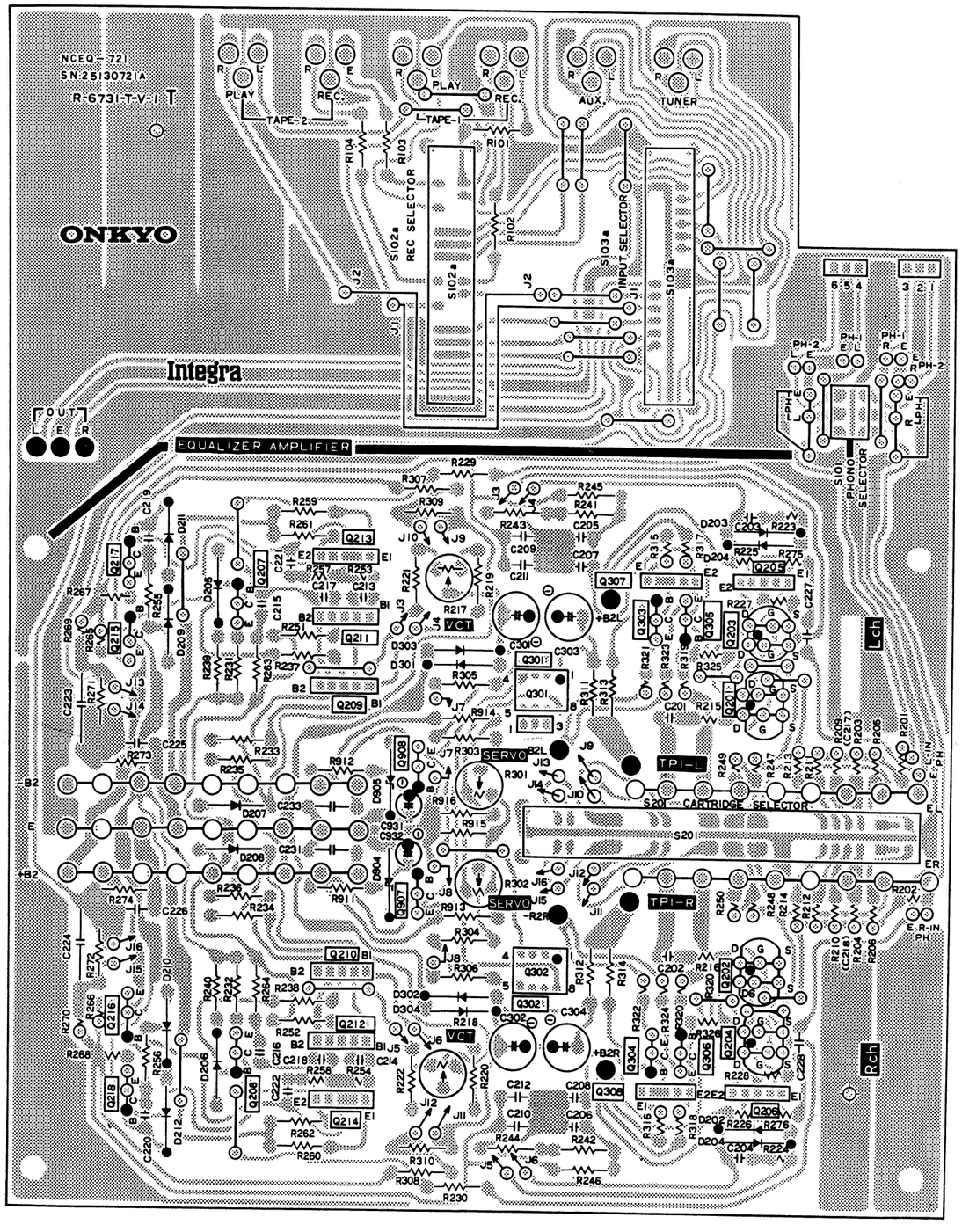
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Resistor	
R423	5104077	N40DGL100KT30M

OUTPUT AMPLIFIER PC BOARD (NAOP-726C)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC2	
Q521, Q522	222502	NJM-4558DX
	Transistors	
Q501, Q502	2212185	2SK170(GR) or
Q513, Q514	2212186	2SK170(BL)
Q503, Q504	2211445 or	2SC2291(F) or
Q507, Q508	2211446	2SC2291(G)
Q505, Q506	2211585 or	2SA979(F) or
	2211586	2SA979(G)
Q509, Q510	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q511, Q512	2211792 or	2SA992(F) or
	2211793	2SA992(E)
Q801, Q802	2211163 or	2SC2120(O) or
Q911, Q912	2211164	2SC2120(Y)
Q901	2200413	2SB596(Y)
Q902	2200744	2SD526(Y)
Q903, Q905	2211254 or	2SC1815(Y) or
	2211255	2SC1815(GR)
Q904, Q906	2211454 or	2SA1015(Y) or
	2211455	2SA1015(GR)
Q913, Q914	2211503 or	2SA950(O) or
	2211504	2SA950(Y)
	Diodes	
D501-D504,	223133 or	DS442X or
D804-D806,	223105	1S1555
D511-D514		
D801, D901	223867	WL02

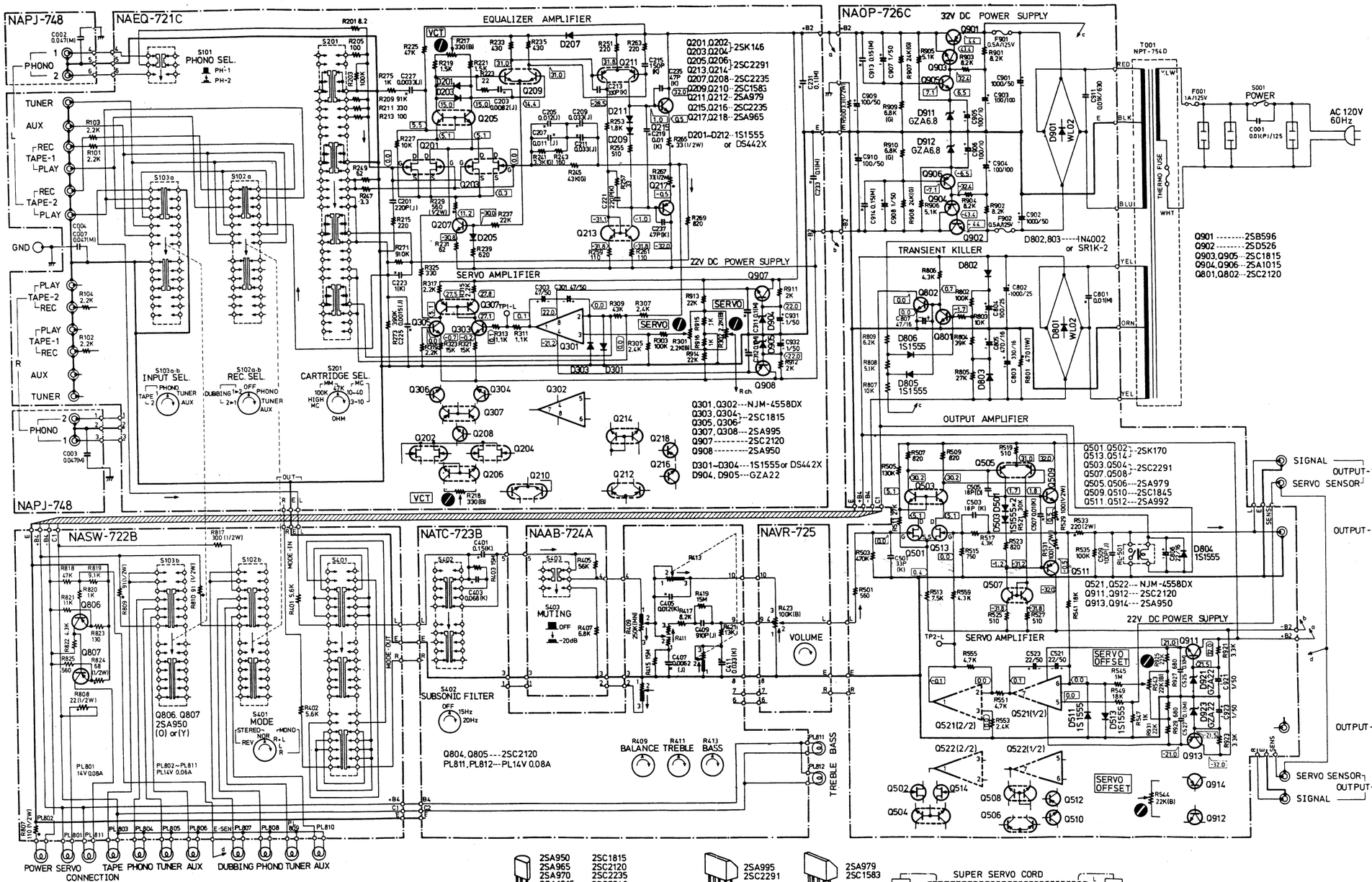
PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE

NAEQ-721



SCHEMATIC DIAGRAM

120V model



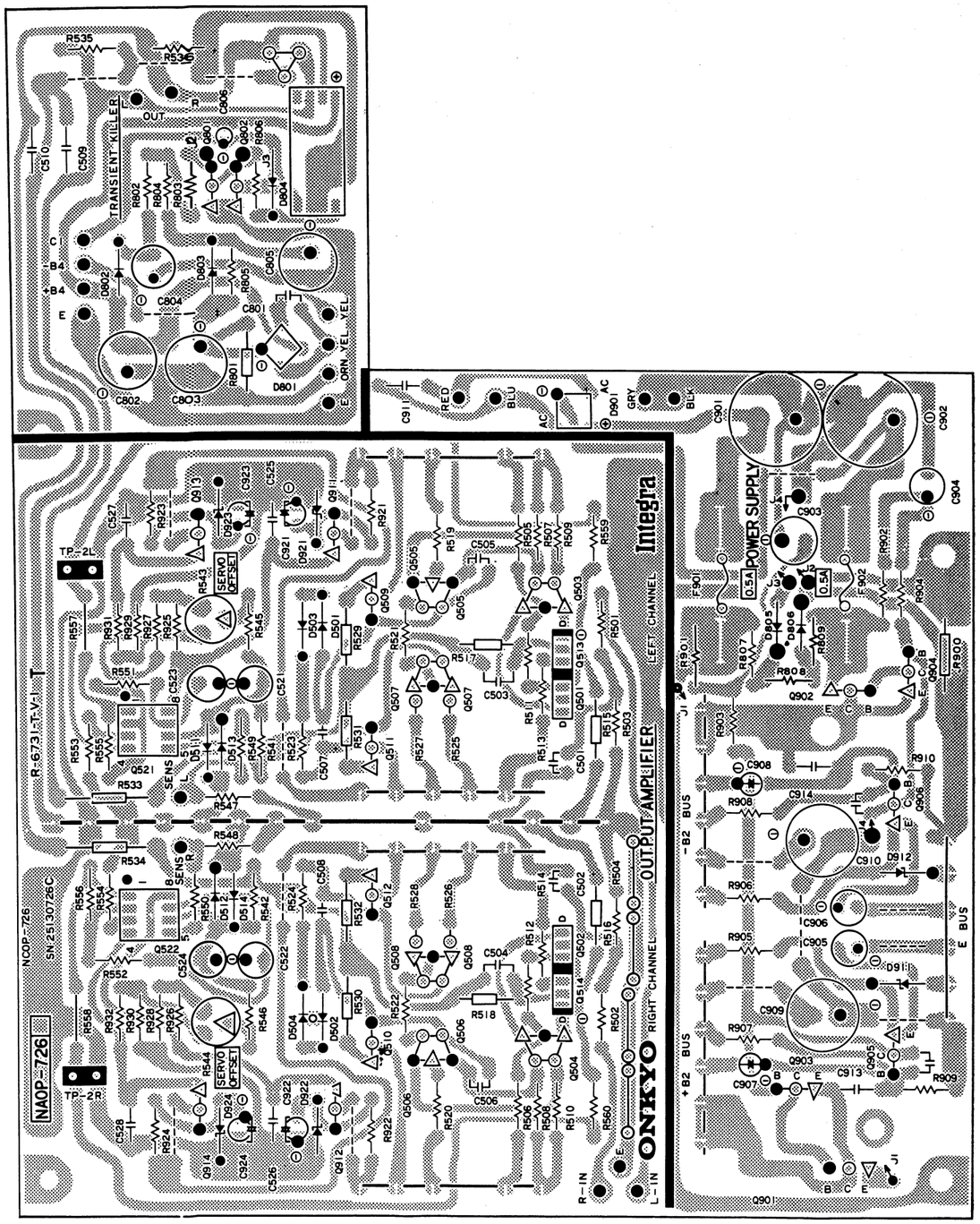
NOTE: 1. DC VOLTAGES (▭) ARE MEASURED WITH V.T.V.M. TO CHASSIS AT NO SIGNAL APPLIED.
2. UNLESS OTHERWISE SPECIFIED.
RESISTORS ARE IN OHMS, ±5%, ¼W.
CAPACITORS ARE IN μF/50V
ELECTROLYTIC CAPACITORS (-⊣⊢-) ARE IN μF WV.
3. TOLERANCE

SYM.	G	J	K	M	P	D
TOL.	±2%	±5%	±10%	±20%	+100% -0%	±0.5PF

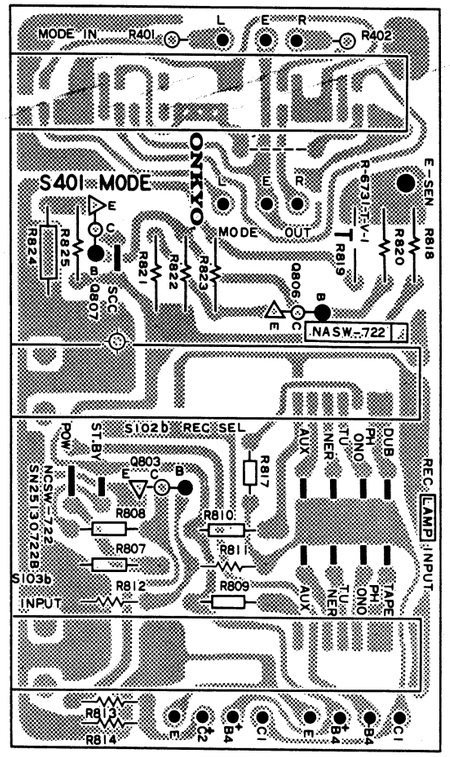
4. SYMBOL
× NON-INDUCTIVE POLYESTER FILM CAPACITOR.
● NON-INFLAMMABLE RESISTOR.

ONKYO CORPORATION

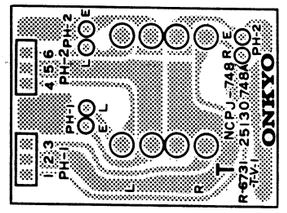
NAOP-726



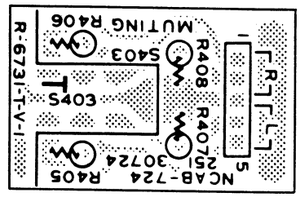
NASW-722



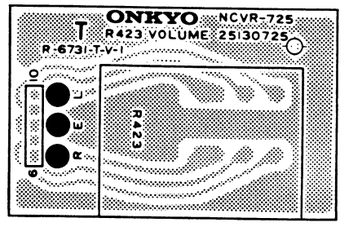
NAPJ-748



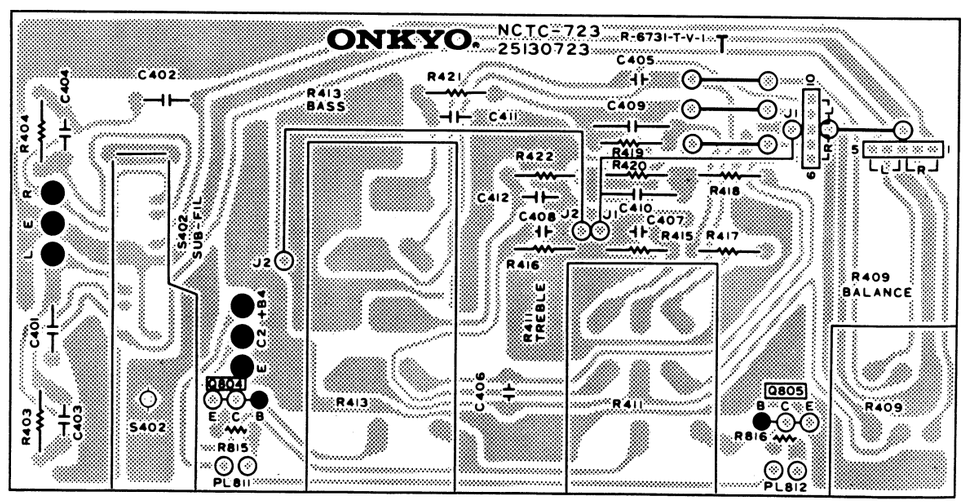
NAAB-724



NAVR-725

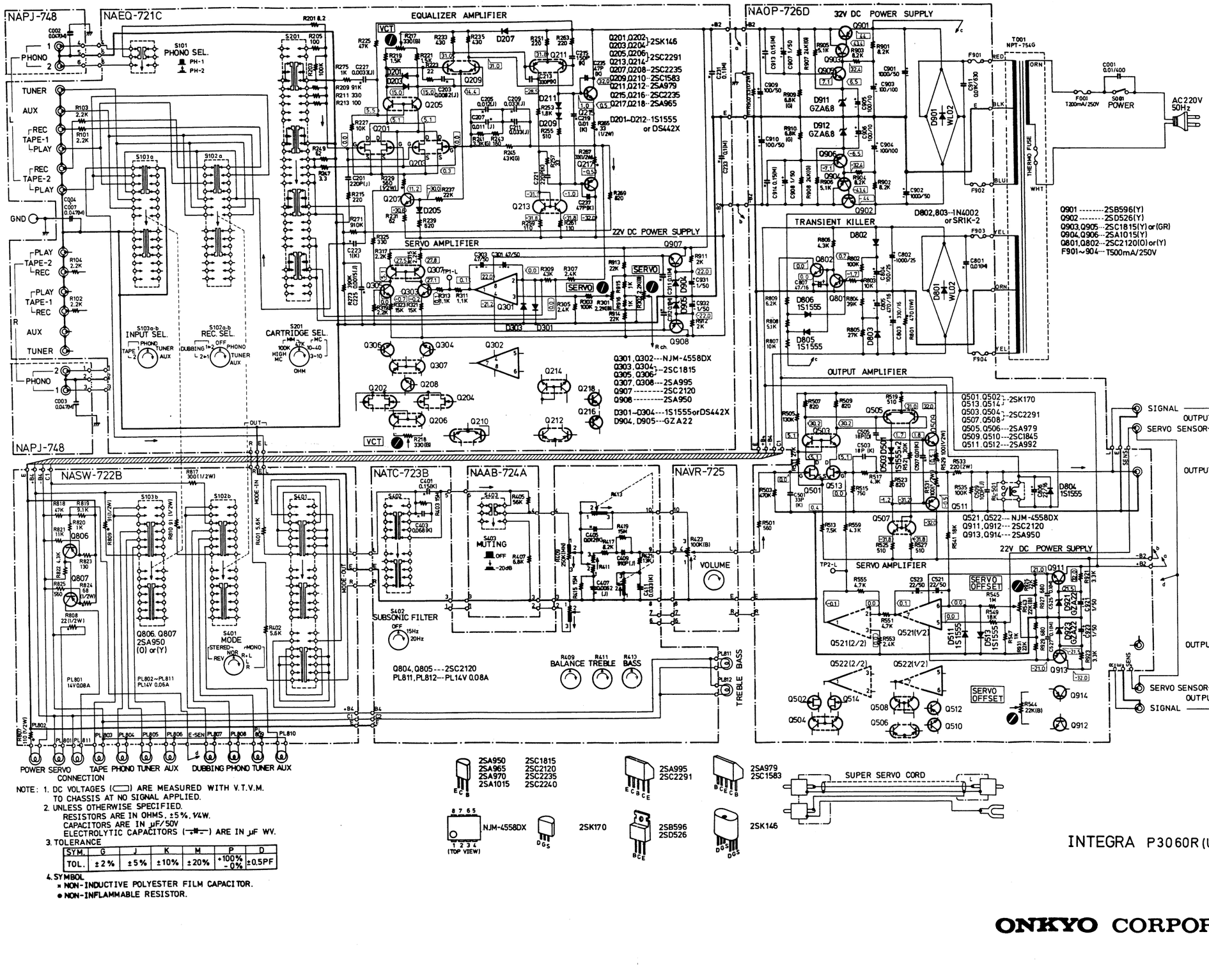


NATC-723



SCHEMATIC DIAGRAM

220V model



NOTE: 1. DC VOLTAGES (▭) ARE MEASURED WITH V.T.V.M. TO CHASSIS AT NO SIGNAL APPLIED.
2. UNLESS OTHERWISE SPECIFIED.
RESISTORS ARE IN OHMS, ±5%, ¼W.
CAPACITORS ARE IN μF/50V
ELECTROLYTIC CAPACITORS (-⊕-) ARE IN μF WV.
3. TOLERANCE

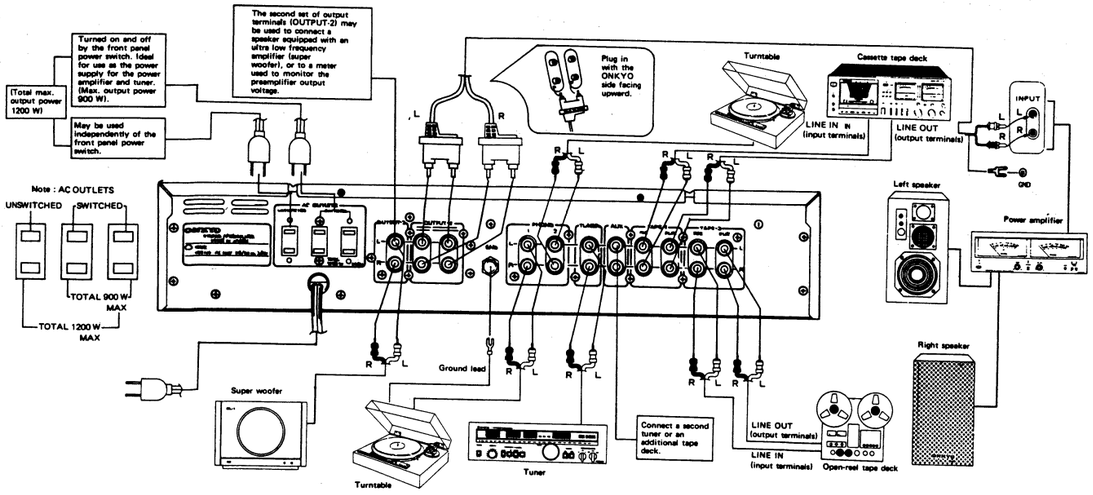
SYM.	G	J	K	M	P	D
TOL.	±2%	±5%	±10%	±20%	+100% -0%	±0.5PF

4. SYMBOL
× NON-INDUCTIVE POLYESTER FILM CAPACITOR.
● NON-INFLAMMABLE RESISTOR.

INTEGRA P3060R(UG)

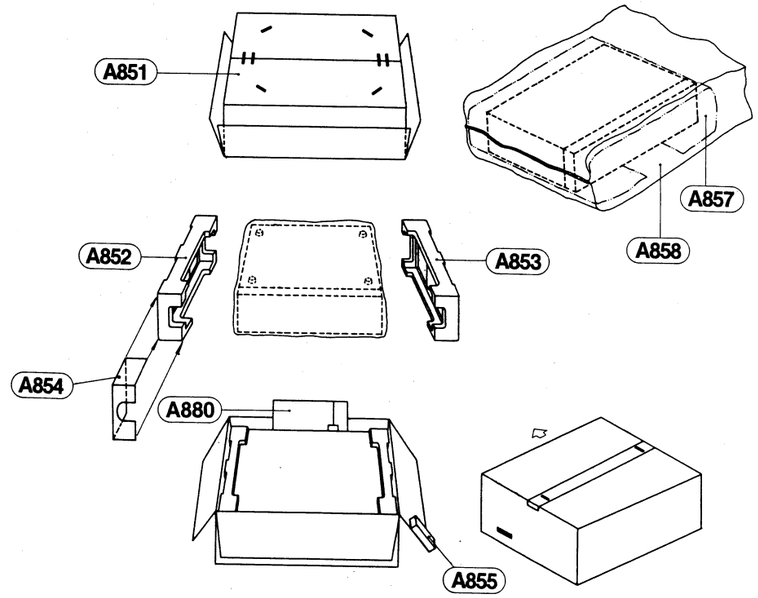
ONKYO CORPORATION

SYSTEM CONNECTIONS


Turned on and off by the front panel power switch. Ideal for use as the power supply for the power amplifier and tuner. (Max. output power 900 W).
(Total max. output power 1200 W)
May be used independently of the front panel power switch.
The second set of output terminals (OUTPUT-2) may be used to connect a speaker equipped with an ultra low frequency amplifier (super woofer), or to a meter used to monitor the preamplifier output voltage.
Plug in with the ONKYO side facing upward.
Turntable
Cassette tape deck
LINE IN (input terminals)
LINE OUT (output terminals)
INPUT
GND
Note : AC OUTLETS
UNSWITCHED
SWITCHED
TOTAL 900 W MAX
TOTAL 1200 W MAX
Left speaker
Power amplifier
Right speaker
Ground lead
Super woofer
Turntable
Tuner
Connect a second tuner or an additional tape deck.
LINE OUT (output terminals)
LINE IN (input terminals)
Open-reel tape deck

- Confirm that all pin-plugs are firmly secured.
  If a plug becomes loose and proper grounding is lost, an unpleasant booming noise is generated. Furthermore, always handle cables with adequate care, holding the plug at its base - not the cable itself - when connecting and disconnecting.
- Keep the pin-type cables as far away as possible from the power cord and power transformer area.
  Otherwise, hum and other unwanted noise may be generated.
- Do not plug in the power cord until all connections have been completed and thoroughly checked.
- Make sure that the L and R pin-type cables are properly connected to the left and right terminals. Otherwise, the left and right sound will be reversed.
- Althogh the turntable ground lead is usually connected to the amplifier GND terminal, there are turntables which do not require a ground connection.
- The rear panel AC OUTLETS are designed for use with other audio components. Do not use as the power supply for hair driers or other heating appliances.
  Although the P-3060R may be connected to the power amplifier with normal pin-type cables for normal audio amplifier performance, it will not be possible to take advantage of the Dual Super Servo circuit.
  If the use of ordinary cables is unavoidable, connect to the power amplifier input terminals via the OUTPUT-1 SIGNAL terminals or the OUTPUT-2 terminals. Connect the ground lead where necessary.

PACKING PROCEDURES



SYMBOL NO.	PARTS NO.	DESCRIPTION
A851	29050596	Master carton box
A852	29090452	Pad, left
A853	29090453	Pad, right
A854	29090663	Pad
A855	29090659	Pad
A857	29095012-1	500 x 800mm, Protection sheet
A858	28100037A	720 x 950mm, Poly bag
A880		Accessary bag complete
	29340647	Instruction manual (D/U)
	29340648	Instruction manual (G/V)
	29365006-4	Warranty card (U)
	29365005-3	Warranty card (V)
	29358002	Service station list (U)
	29100006	350 x 250mm, Poly bag
	2010068	Super servo cable
	250153	PO107, Shorted pin (phono 2)

Note
(U) : Only U.S.A. model
(V) : Only West Germany model
(D) : Only 120V model
(G) : Only 220V model

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